REMARKS

Section 102 rejection

Sfarti[1] teaches a method for drawing three-dimensional objects on a stationary two-dimensional display space. The resulting image, which is intended to appear three-dimensional, is referred to by *Sfarti* as a "volumetric image," presumably because it is an image of an object that has a volume. However, the mere fact that an object on a two-dimensional display happens to appear three-dimensional does not make that display into a "volumetric display."

A television, for example, can show a representation of a three-dimensional object. Yet, if one were to walk around to the back of a television, one would see a dust-covered plastic case enclosing a CRT. Certainly, few among us would admit to expecting to see the backs of people's heads just by walking around to the back of a television.

The examiner's interpretation of the term "volumetric display" as encompassing any display capable of displaying images that *appear* three-dimensional would mean that televisions, movies, and photographs are all "volumetric displays." The proposed interpretation is so broad that it ignores the fundamental difference between, for example, painting and sculpture. It ignores the fundamental difference between the *illusion* of three-dimensionality, as seen in a film, and the *reality*, as seen in a live performance.

In contrast, in Applicant's volumetric display, one *can* in fact walk around to the "back" to see the backs of people's heads. In fact, in a volumetric display, unlike the two-dimensional display of *Sfarti*, the notion of "front" and "back" becomes largely meaningless. The three-dimensional image generated on a volumetric display is not just an illusion. It truly *is* three-dimensional.

Applicant's claimed invention is directed to displays that form genuinely three-dimensional images, and not merely the illusion of such images. *Sfarti*, on the other hand,

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[1] *Sfarti*, et al., U.S. Patent No. 5,515,484.

describes a device that provides the mere *illusion* of a three-dimensional image. Thus, *Sfarti* fails to teach or suggest:

> "[a] method of rendering, on a *volumetric display*, a rasterized line."

Since *Sfarti* has nothing to do with volumetric displays, nowhere can *Sfarti* teach claim 1's step of:

> "positioning a screen at a first angular position at which said screen is coplanar with an entry plane"

The Examiner draws attention to column 4, lines 30-36 as allegedly teaching this step. For the Examiner's convenience, the relevant language is reproduced below:

> The present invention comprises a method for rendering a three dimensional graphic object in a two dimensional display space by segmenting the object into parallelepipeds and decomposing the parallelepipeds into rods of voxels that are parallel to the depth axis (Z) of the display and by projecting the rods of voxels onto the X-Y plane of the display as lines of pixels. [2]

As best understood, the Examiner considers the "two-dimensional display space" to correspond to the claimed "screen." It is not clear, however, how the cited language teaches anything about "positioning the screen at a first angular position at which it is coplanar with an entry plane." There is no notion of an entry plane introduced in the language. Nor is there any indication that the two-dimensional display is even supposed to be moving.

The entire specification appears to be predicated on the notion that the two-dimensional display is a conventional computer monitor, which is not intended to rotate. For example, in its preamble, *Sfarti*'s claim 1 refers to "[a] method for drawing a single pixel antialiased line by rendering two pixels nearest an ideal line having a start point and an end point *on a display of a computer.*"[3]

In describing the distinction between his invention and the prior art, *Sfarti* states:

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[2] *Sfarti*, col. 4, lines 30-36.
[3] *Sfarti*, col. 29, lines 2-5, emphasis supplied.

> Before describing a particular application of the line drawing features of the present invention to the drawing of antialiased volumetric images, the general principal of rendering volumetric images will be briefly discussed. As previously noted, traditional methods for rendering volumetric images in two-dimensional display space required that the image to be rendered be broken down into a plurality of parallel planes that are layered in the direction of the depth axis of the display. The present invention presents a simple but elegant alternative to this technique by allowing the three dimensional graphic objects to be rendered in a two dimensional display space by segmenting the object into parallelepipeds and decomposing the parallelepipeds into rods of voxels that are parallel to the depth axis (Z) of the display and by projecting the rods of voxels onto the X-Y plane of the display as lines of pixels.[4]

It is clear from the foregoing that *Sfarti* fails to teach a volumetric display that forms actual three-dimensional images. What *Sfarti* teaches is a method for generating the *illusion* of a three-dimensional image on a *stationary* two-dimensional display, such as a conventional computer monitor. There is no teaching of the concept of an entry plane or exit plane as recited in claim 1. The *Sfarti* reaches rendering an image on a *stationary* display, not a rotating display.

To anticipate a claim, a cited reference must teach each and every limitation in that claim. *Sfarti* clearly fails to teach even the preamble of claim 1. In additional, *Sfarti* fails to teach the notion of an entry and exit plane, or of changing the angular position of the screen to be coplanar with the entry plane. For at least these reasons, the proposed section 102 rejection cannot be sustained.

The foregoing arguments are applicable to the remaining independent claims. The dependent claims include the limitations of their respective parent claims and are therefore allowable for at least the same reasons.

Now pending are claims 1-30, of which claims 1, 16, and 30 are independent. Applicant reminds the Examiner that claim 30 does not appear to have been addressed in the present office action.

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[4] *Sfarti*, col. 9, lines 3-17.

A petition for extension of time is included with this response. No additional fees are believed to be due in connection with the filing of this response. However, to the extent such fees are due, or if a refund is forthcoming, please adjust our deposit account 06-1050, referencing attorney docket "10857-009001."

Respectfully submitted,

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